

JPRS 75596

29 April 1980

# USSR Report

TRANSPORTATION

No. 5



FOREIGN BROADCAST INFORMATION SERVICE

## NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [ ] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

## PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

29 April 1980

# USSR REPORT TRANSPORTATION

No. 5

## CONTENTS

PAGE

### MOTOR VEHICLE

|                                                                                                                  |   |
|------------------------------------------------------------------------------------------------------------------|---|
| RSFSR Minister Cited on Roadbuilding Problems<br>(I. Pyrkh; SOVETSKAYA ROSSIYA, 19 Mar 80).....                  | 1 |
| Measures To Conserve Motor-Vehicle Fuel<br>(L. Yakovlev; MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE,<br>Feb 80)..... | 9 |

### RAILROAD

|                                                                                                                            |    |
|----------------------------------------------------------------------------------------------------------------------------|----|
| Computerized Reservation System Detailed<br>(S. G. Kavan, V. A. Timukhin; ZHELEZNODOROZHNY<br>TRANSPORT, No 10, 1979)..... | 14 |
| Savings Realized by Use of Computers<br>(A. P. Abramov, et al.; ZHELEZNODOROZHNY TRANSPORT,<br>No 10, 1979).....           | 25 |
| Briefs<br>BAM Route Geological Map                                                                                         | 35 |

### OCEAN AND RIVER

|                                                                                                                |    |
|----------------------------------------------------------------------------------------------------------------|----|
| Minister of Maritime Fleet Discusses Fleet's Performance<br>(T. B. Guzhenko; VODNYI TRANSPORT, 19 Jan 80)..... | 36 |
| Briefs<br>New Ship Series                                                                                      | 48 |
| New Automated Management System                                                                                | 48 |
| Fishing Results                                                                                                | 49 |
| Fishing Equipment Problems                                                                                     | 49 |
| Assistance to Kampuchea                                                                                        | 49 |
| Pevek Port Cranes                                                                                              | 49 |

## MOTOR VEHICLE

### RSFSR MINISTER CITED ON ROADBUILDING PROBLEMS

Moscow SOVETSKAYA ROSSIYA in Russian 19 Mar 80 p 2

[Article by I. Pyrkh, special correspondent of SOVETSKAYA ROSSIYA:  
"A New Road; Why Motor Highways are Being Built So Slowly"]

[Text]      Only to the Outskirts

Two years ago residents of the village of Khoromnoye in Bryanshchina solemnly inaugurated motor vehicle traffic along the asphalt road which connects the "Put' Lenina" kolkhoz with the rayon main highway. Three years were spent in order to build 12 kilometers of reliable roads leading to other routes and 5 kilometers of reliable roads through the streets of the village and leading up to 2 farms.

"We built them ourselves but workers in the "Dorkolkhozstroy" trust also helped us a great deal," says F. V. Kovalev, chairman of the kolkhoz. "Certainly much time, manpower and means were assigned to the task but it could not have been done otherwise. A road to the village is really the road for our growth in the full sense of the word."

Facts and figures are cited in confirmation of Fedor Vasil'yevich. The freight turnover for motor transport has doubled, the cost of transporting has been cut in half, fuel consumption has decreased by a factor of 1.5, motor vehicles are being repaired only half as often.... In a word, in comparison with the "roadless" past, an annual gain of more than 1,000 rubles is obtained for each motor vehicle. In addition, losses have vanished during the transportation of crops and mineral fertilizers.

As to economics, the gain here is most direct. It has been calculated that each ruble which is invested to construct motor highways is translated into a return of 4 rubles 30 kopecks. A major highway means the efficient utilization of transportation, fuel economy and the development of production in industry, construction and agriculture. But this is not all.

At the same time Khoromnoye, in the words of the chairman, now solves social problems more quickly and successfully. In the past 2 years about 30 families have celebrated housewarmings in new homes, a sewing factory subsidiary opened where many women and girls have found work that they like. A House of Culture and a House of Everyday Life have thrown open their doors. Young specialists who are returning from the army as demobilized soldiers are coming here with pleasure to work. Khoromnoye has grown younger in the broadest sense of the word.

There are many villages which are feeling a beneficial effect in connection with the building of the road in Bryanskaya Oblast, in neighboring oblasts--Smolenskaya, Orlovskaya and Kaluzhskaya, as well as the entire Nechernozem'ye area and all of Russia. Many but far and away not all. In the same Bryanshchina 1,500 kilometers of main roads must be built in order to join just the central farmsteads of the kolkhozes and sovkhoses with the republic and oblast main highways. Many villages and towns are waiting for roads to reach them that can be used in rain, slush and in the bad road season--at any time of the year.

About 9,000 kilometers of roads with improved surfaces are being added in the Russian Federation during the year. Is that many or a few? Previously, about 20 years ago, such a volume of road construction would have been considered an excellent achievement but today it is clearly insufficient. According to calculations made by the All Union Scientific Research Institute of Highways the level of growth in roads lags behind the rate of stocking motor pools by a factor of 1.5, not to mention the urgent necessity of solving the many pressing social-economic problems, among them the creation of favorable conditions for developing villages and freeing rail transport of so-called short run hauls....

"We are building only half of the roads that are needed both in quality and quantity," A. A. Nikolayev, the RSFSR Minister of Construction and Maintenance of Roads, declares categorically. "Transportation problems cannot be solved only by increasing the output of motor vehicles, their cargo capacity and roadability. More high quality roads are needed first of all...."

It is impossible, as they say, to have differing opinions on this. So why then are fewer roads being built today than are needed? There are many very complex, simple and completely insignificant reasons.

A study of various documents, long discussions with Minister A. A. Nikolayev, workers in USSR Gosplan, the USSR Ministry of Transport Construction and in other ministries and departments and with highway construction workers at construction sites have aided in determining the more important aspects in the multitude of questions related to this complicated problem.

First we will relate what A. A. Nikolayev noted--the technical backwardness of highway construction technology. Road builders now have much equipment; there are about 50,000 units in the above-mentioned RSFSR Ministry of Construction and Maintenance of Roads--namely units and not modern technological complexes.

The second great deficiency that specialists point to is the lack of unity and splintering in highway construction. There are branches but no trunk--that's the way things are in this oblast, according to the figure of speech used by V. P. Karpunenkov, Deputy Chief of the Transport Department in USSR Gosplan.

Today, many organizations on various professional levels, with varying amounts of knowledge of affairs, technological equipment and monetary and material resources, are engaged in highway construction. In addition to professional road builders in the USSR Ministry of Motor Transport and the "Roskolkhozstroy" Association, organizations in the RSFSR Ministry of Housing and Municipal Services, industrial and agricultural construction workers, enterprises, kolkhozes, sovkhoses, and even hired "sabbath workers" have proved themselves in this field.

Every highway organization creates a construction base and acquires technology. Those who expand more energetically have bases that prove to be more solid, and their surrounding neighbors are weaker. One has a capacity surplus and equipment stands idle, another, having almost nothing, obtains something by hook or by crook and is attempting to "get out" of the situation.

In Bryashchina, for example, the Ministry of Housing and Municipal Services has more than 10 asphalt plants but no raw materials. Naturally, the plants are standing idle. The "Dorkolkhozstroy" trust has much fewer capacities and in turn it has raw materials and is processing them with difficulty. And take highway design. In each oblast the "Grazhdanproyekt," "Sel'khozproyekt" and "Kolkhozproyekt" institutes and design offices in the Ministry of Motor Transport are engaged in this work. And, as the construction workers say, each "molds" the highway in their own way.

Proposals have already appeared in the oblasts to organize oblast headquarters for coordinating highway construction centers to at least somehow tie in the many organizations into a related whole--their capacities, design estimate activities, exploitation of open pits, utilization of asphalt plants, etc. But will there be any sense to these headquarters?

Executives frankly declare that diversity in highway construction is not only and not so much due to highway necessities as it is due to the absence of a unified production line.

They have created 47 "Dorkolkhozstroy" trusts in the "All Russian Kolkhoz Construction Association." In this way they were striving for their own brand of specialization. They say that the oblast administration in the Ministry of Motor Transport builds oblast and rayon highways and access roads to kolkhozes and sovkhoses and the "Dorkolkhozstroy" trusts build the intraorganizational roads. But this specialization really amounts to a paradox.

Recently the Bryanskaya "Dorkolkhozstroy" built roads for the kolkhozes "Rodina" and "Znamya Kommunizma." They are good five kilometer sections with both ends being just difficult open terrain. A state commission for accepting these highways, N. A. Krayukhin, administrator of the trust related, had to be taken there on a tractor. It is both funny and sad. And when the trust undertook to build an access route from the asphalt road at the request of one farm the Stroybank cut off financing and vetoed it: "Don't poke your nose into other people's affairs."

What is more important to a kolkhoz or sovkhos--a reliable, year-round highway link to the oblast main highway or an asphalt section through the village and surrounding fields? Certainly it would be fine to have good intraorganizational hard surface roads but any administrator and any resident of the village would vote first of all for access to the main highway. Almost half of kolkhozes and sovkhoses in Branshchina, for example, do not have such access roads and the "Dorkolkhozstroy" trust is not being authorized to build them.

For a fundamental solution to the highway problem a strong unified sector is needed which would be engaged in planning, design, construction and utilization of roads on a scientific basis. Scientists, important administrators, economists, and highway builders say this with a single voice.

#### At an Impasse to Agreement

At the speed of about 100 kilometers, but feeling neither pitching nor jolts, it is as if you are speeding along a calm sea. Not one drop spills from the full glass of water which is standing next to the driver. Excellent! Such was my first indirect acquaintance with the roadway units which were laying down two lanes of the highway which has a length of about 50 kilometers. It is a high speed highway with a perfectly level surface.

Powerful machines appeared in view on the 59 kilometer Moscow-Simferopol' road. Ahead on the embankment, occupying its entire width, a contour machine moved at a snail's pace, leveled the subgrade, stripped and removed the unevenness. A machine with the same configuration followed behind it mixing and laying down an even layer of gravel which

is being spread by the dump trucks in front of it and packing the road bed down with vibration devices. Beyond, a concrete spreader and a separate machine were moving along. Dump trucks approached one behind the other with gravel and concrete. We saw a genuine highway construction conveyor--in essence, an entire plant. Many machines and hardly any people were at the construction site.

What, then, are the advantages of the new units in comparison with the existing highway construction system? They are many and we will single out only the main ones.

First--one unit is capable of laying up to 1,500 linear meters of a concrete roadway on a prepared earth fill in a shift. Compare 100 to 150 meters with 1.5 kilometers.

Second--the high level of mechanization and automation in construction work. One unit frees about 500 persons from labor-consuming operations. And finally, third--these machines build high quality roads.

Thirty units are now being used at construction sites throughout the country and all are concentrated in the USSR Ministry of Transport Construction. In 6 years more than 1,000 kilometers of superhighways have been built by them.

"Our main directorate was the first to begin production of these new units," relates V. A. Subbotin, chief of the Main Central Administration for Construction of Roads and Highways. "These machines are vitally necessary today and they will be needed even more tomorrow and the day after. Many more of them are needed."

Road units are intended mainly for construction of main highways. Well, what about oblast, rayon and agricultural roads? With what do you build them? With the very same bulldozers and road graders that cover 50 meters a day?

At the Bryansk road machine plant, where DS-110 units are turned out, chief engineer V. S. Terekhov, assistant to chief designer V. G. Yeroshenkov, showed us a design for a highly productive, general purpose machine that is also for building secondary roads. The designers acted in a simplified and wise manner. They took the contour machine unit, equipped it with a suspended hopper for taking on asphalt concrete and obtained a machine, as they say, for all possible conditions in life. It is capable of completing all of the operations on a prepared earth fill beginning with grading and ending with laying down the asphalt or concrete roadway. It is fast, neat and is done once without the use of manual labor. This machine has been tested but we won't see it at construction sites: it is not being produced.

The fact of the matter is that the use of new road units requires a large construction base, efficient cooperation by large groups of people and technology and coordination of the timing of many services. In order to build a main highway at the rate of only one kilometer per shift, cement, gravel and sand must be delivered every hour in sequence. In addition, it is also necessary to have mobile squadrons, cement warehouses, a cement plant and a column of high capacity dump trucks (about 100 units). We repeat: all of this is needed for one unit. And what if dozens are being produced?

Our construction and related departments have not proved themselves prepared for such a huge amount of organizational work. This is why a cooling-off period has begun relative to this highly productive automated technology and to its production.

They have mastered production of the DS-110 at the Bryanskaya road machine plant. A collective of qualified engineers and laborers was formed here that is capable of designing, manufacturing and, what is no less important, servicing the new machinery for the users. But even the three units which were produced ran into great difficulties and they are not at fault in this.

"We are ready to free the Bryanskaya plant of other work and to completely transfer it to the production of contour machines for building secondary roads," says V. I. Chudin, Deputy Minister of Construction, Road and Municipal Machine Building in the USSR. "A program is being put together and there are many requests from builders for this technology. The Ministry that should be delivering the complementary required items and assemblies to us is avoiding this in every way possible. It is particularly difficult to acquire the diesel 'hydraulics'."

In the Ministry of Construction, Road and Municipal Machine Building they showed us a portfolio with correspondence related to these problems. We will cite a passage from the letter of V. A. Kazakov, Minister of the USSR Aviation Industry: "The development and production of assemblies in the aviation industry are done on the basis of requests that take into account the specific manner and particularly crucial conditions under which aviation technology is utilized. The use of such assemblies for highway construction has no technological or economic basis."

We will note: the operating parts in the hydraulic units are very powerful, sensitive and manufactured on a par with "aviation technology." Otherwise their use will be linked to frequent "failures" in automatic equipment, resulting in the disturbance of the construction tempo. Speaking to the point, machine builders are not requesting anything extraordinary from aircraft builders--only completely finished filters.

The Ministry of the Automotive Industry must now set aside approximately 15 diesel engines from the Yaroslav plant for building the DS-110 system. No more! Yet how many obstacles have been added along this route. One of the most complicated is "coordination of the modification." USSR Gosplan and ministries speak of this concept: "Coordination of the modification has been transformed into a hindrance to technological progress."

In order to simplify things we will explain what kind of a "hindrance" this is. Let's say that a certain enterprise has invented a fine machine. They have found out which plant produces suitable engines and have sent messengers there: so, they say, so comrades---won't you sell us motors.... Certainly, answer the manufacturers, only first come to an agreement with our ministry so that they will authorize the use of the engine in your machine and coordinate the modification of the engine. And the ministry answers: you must think about it and see how the engine "behaves" in your assembly and in about three to four years after experimental use, if everything is okay, we will coordinate the modification.

Road machine builders ended up in an analogous situation. They solicit diesel engines from motor vehicle manufacturers who answer: "Your modification is not coordinated." So coordinate it, say the machine builders, bowing and scraping.... And everything goes around in a new circle and road machine builders have in no way been able to break this circle. They are able to "pry loose" only several diesel engines per year with great difficulty.

"We are not making the modifications because the operating conditions for road machines are different than for motor vehicles and we do not know how our diesel engine will operate. Let the road builders utilize the diesel engine experimentally"; thus did Ye. S. Bavin, Chief Designer of the engines for the Ministry of the Automotive Industry, explain this complex situation.

But, really, everyone could already have been convinced long ago that the diesel engines from the Yaroslav plant operate dependably in road machines and at the present time, in the absence of something better, they are the most suitable. The diesel engine has been used for four years in the DS-110 units yet motor vehicle manufacturers are still being stubborn.

Among the opponents of the series production of highway technology, doubts of the following kind appear today: where can additional metal be obtained? Will construction workers be able to lay down subgrades for the high speed machines, etc.?

There is no practical basis for such doubts. Let's take metal. Enterprises in the Ministry of Construction Road and Municipal Machine Building produce thousands of inefficient outmoded machines annually such as the DS-74 highway rotary plow and the DE-99 lightweight grader. They must be withdrawn from production, say road builders, and the metal "recast" into DS-110 units and contour machines.

As to earth fill there is a sufficient supply; it is true that they are not for main highway routes but for "secondary" roads. Hundreds of kilometers of subgrades which are laid down are building up in each oblast.

Certainly hundreds of objections may be found but for each of them a ponderable counter argument is found. But, it is thought, this is not the way we need to go. Roads are acutely needed by our rapidly developing economy and the faster that new units will be created the more successfully this problem may be solved.

9495

CSO: 1829

## MOTOR VEHICLE

### MEASURES TO CONSERVE MOTOR-VEHICLE FUEL

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 2, Feb 80  
pp 40-42

[Article by L. Yakovlev, Chairman of the Central Committee of the Union of Motor-Transport and Highway Workers: "Motor Transport to Save on Fuel"]

[Text] Problems of economizing on fuel and energy resources are constantly at the center of attention of trade-union organizations. These problems are regularly considered at workers' meetings and at sessions of the trade-union committees. The discussion has been preceded by a great deal of analytical work at motor-vehicle enterprises and combines. Therein advanced experience is pooled, shortcomings are revealed, and measures to eliminate them are planned. Guided by the decisions of the November 1979 Plenary Session of the CPSU Central Committee, as well as by the decrees of the CPSU Central Committee and the USSR Council of Ministers on improving the economic mechanism, the groups of the Moscow motor-vehicle enterprises are intensifying the struggle to conserve fuel resources and to completely utilize existing reserves. The groups at such enterprises and organizations are conducting multi-faceted work with regard to economizing on petroleum products. Greater and greater scope is being attained by socialist competition, "raids" to check up on fuel expenditures, contests for the best efficiency experts' suggestions and inventions, and the dissemination of progressive innovations. These labor groups participate in the All-Union Public Review of Effectiveness in Utilizing Raw Materials and Fuel and Energy Resources. All this is yielding substantial results.

A significant contribution to the common savings "coin-box" is being made by Mosavtolegtrans (Moscow Motor-Vehicle Passenger Transport Service)--the country's largest motor-vehicle transport association. At the present time it includes 26 specialized motor-vehicle enterprises, having 24,000 motor vehicles at their disposal. Every day taxis issue forth from the gates of the motor pools and motor-vehicle combines, rushing to pick up visitors to the capital as well as its inhabitants. The main-line mini-buses of RAF (Russian Motor-Vehicle Federation) /not verified/ drive out in various directions along their assigned routes. More than 6,000 motor vehicles race toward the buildings of ministries, departments, and other institutions.

The demand for taxi transportation and departmental service is growing constantly. Under these conditions the operational mileage of motor vehicles is increasing substantially. Thus, the average annual operation of a taxi amounts to 70--85,000 km, while that of a motor vehicle in departmental service is 30--35,000 km. The total annual mileage of the administration's motor-vehicle pool amounts to almost 1.5 billion km. The expenditure of gasoline reaches 160,000 tons, while that of engine oil is more than 2,000 tons.

The figures cited above testify that Mosavtolegtrans is a major consumer of gasoline, fuel and lubricating materials. Because they understand this, the administration's group is conducting a great deal of work with regard to the economical and efficient utilization of fuel and energy resources. As a result the annual savings are equal to 9,000 tons of gasoline and hundreds of tons of engine oil. Such results have been achieved by means of increasing the effective utilization of rolling stock, increasing the proportion of its useful operation, and reducing operational expenditures.

It is far from simple to reduce operational expenditures. With the increase of prices for fuel and lubricating materials the expenses of motor-vehicle systems have grown. Last year for the administration as a whole they almost doubled (as compared with 1977). Nevertheless, if we operate economically, we can find ways to reduce expenditures. For example, good results may be obtained by re-examining the norms of expenditure, as well as by promulgating specific measures aimed at improving the motor pool's technical condition.

Let's examine each of the facts mentioned above in detail. First let's speak about norms. More progressive norms have been introduced, i. e., relative norms for the expenditure of fuel per unit of transport operation. Such relative norms were worked out on the basis of linear norms with the aid of a coefficient of the motor vehicles' paid mileage. And the greater this coefficient, the less the relative coefficient and the greater the effect of actual savings. Thus, to fulfill the 1979 plan indicators, the administration established an estimated coefficient of paid mileage of 0.746. In practice it turned out to be somewhat higher--0.776. And this alone accounted for the fact that in the first six months more than 5,000 tons of gasoline were conserved, or 5.8 percent of the linear norms.

Another no less important reserve for conservation is the observance of the system of technical operation of the rolling stock. And this is understandable, for the slightest maladjustment greatly increases fuel consumption. So, reducing the air pressure of the tires of passenger cars by 20 percent as compared to the norm increases fuel consumption by 15 percent. When there is misalignment of the front, wheels, tightened brakes, running gear bearings and transmission in the motor vehicles, fuel expenditures increase by 10--15 percent. Improper adjustment of the fuel-injection and ignition systems increases gasoline consumption by 15--25 percent.

Our task consists of not only not allowing over-consumption but also of significantly reducing consumption and thereby assuring substantial conservation. And herein we are aided by coordinated work with regard to raising the level of motor-vehicle technical operation, based on improving the quality of preventive maintenance and repairs. We need to pay more attention to monitoring the technical condition of the rolling stock, and, above all, to the systems of fuel injection, ignition, and exhaust.

At the present time Mosavtolegtrans's motor-vehicle enterprises have mechanized technical-service assembly lines, fitted out with up-to-date hoisting and conveying equipment, approximately 50 brake stands and more than 60 stands for checking and adjusting wheel alignments, as well as 43 units for over-all checks on fuel-injection and ignition systems.

Each enterprise has specialized units for diagnostics and control.

The extensive utilization of precise diagnostic and garage equipment in the technical servicing and repair of motor vehicles ensures Mosavtolegtrans of great savings on fuel and lubricating materials. For example, just the introduction of units to check out motor-vehicle safety systems allows motor-vehicle enterprises with a pool of 1,000 motor vehicles to save as much as 29,000 rubles a year.

The fuel economy of a motor vehicle may be determined not only by direct measurement of the fuel consumption but also by indirect parameters. One such parameter is the volumetric content of the carbon monoxide portion in the exhaust gases. Over the course of several years Mosavtolegtrans in conjunction with the Scientific-Research and Design-Technological Laboratory of Engine Toxicity (NILTD) has conducted work on reducing the toxicity of exhaust gases by means of monitoring and adjusting the engine carburation systems. It has been established that the average carbon monoxide content in exhaust gases when the engine is idling amounts to 5.5 percent, and after adjustment it is 2.2 percent. Moreover, the relative norm of gasoline consumption per motor vehicle is reduced from 0.8 to 0.72 kg. per hour. Adjusting the engine for Moscow conditions becomes all the more necessary in that as much as 35 percent of the time the motor vehicles are idling.

In order to bring about a more effective reduction in the toxicity of exhaust gases and to improve engine fuel economy, the check-up and adjustment for carbon monoxide content are carried out for TO-1 and TO-2. Herein it is mandatory to take into consideration the air temperature and the atmospheric pressure. The results of these check-ups are reflected in journal reports. Such records have become particularly important. They may represent the right to drive out, if all the systems of a vehicle are operating correctly, and if all defects have been eliminated. Putting a motor vehicle onto the line is prohibited unless the data of the check-ups correspond to the established norms and standards. The results of the check-ups are summarized and analyzed for all the motor-vehicle enterprises. This aids us in establishing in which sectors the work has been well-organized and in determining higher end results.

A great deal of attention within the administration is paid to the economical and efficient expenditure of lubricating materials. With this goal in mind, a centralized oil system was created, as well as units for collecting used oils. All the lubrication units have been fitted out with special equipment, thanks to which a high level of mechanization has been achieved and losses almost eliminated. Out of the 2,163 tons of engine oil used per year 572.5 tons have been recycled by means of the centralized system. This amounts to 165 percent of the established plan. Moreover, we have succeeded in increasing the conservation of lubricating materials thanks to the introduction of the new NAMI-VG-10A filtering element for the engine's lubrication system. In comparison with filters used previously, this filter possesses a number of operational advantages, and it costs less. Improved filtration allows for less frequent oil changes in the engine's crankcase. Because of this for three years of the 10th Five-Year Plan savings of more than 630 tons of oil were made, amounting to a sum of about 500,000 rubles.

The administration has also conducted a great deal of work on improving normative-technical documentation, regulating accounts, storage, and effective utilization of fuel and lubricating materials. The Instruction which has been worked out with regard to receiving, storing, and accounting for fuel and lubricating materials in Mosavtolegtrans's motor-vehicle enterprises and the supplements to it are directed at strengthening the conservation system. They have also specified the *modus operandi* with petroleum products. Accounts of gasoline consumption are kept for each motor vehicle and driver. Coupons for fuel are issued only upon fulfillment of the shift assignment. Each month accounts are made of the actual fuel remnants.

Fuel economy depends to a large extent on the skills of the drivers. At the present time the fuel economy of a motor vehicle can be improved by 25 percent by means of observing systems of linear operation and driving skills. Therefore, regular classes with the driving personnel have been organized at Mosavtolegtrans's enterprises. Out of the 39,000 drivers of Mosavtolegtrans more than half have qualified as first- or second-class operators. Some 1200 drivers raise their vocational level every year. The advanced experience of drivers who have attained large fuel economies is widely disseminated throughout all the production groups.

The administration's group is conducting coordinated work on conserving fuel and energy resources. Questions of economizing are regularly considered at Party and trade-union meetings. Here they listen to the reports of individual enterprises, results of socialist competitions are summed up, and prizes are awarded. Mosavtolegtrans takes part in the municipal contest-review on fuel economy which is held among the capital's transportation enterprises. According to the results of the first round the administration won second place. The best results in conserving fuel and

lubricating materials have been achieved by the drivers M. V. Korzhikov (taxi motor pool No. 7), V. G. Parshenkov (taxi motor pool No. 16), G. K. Alekseev (taxi motor pool No. 18). A substantial contribution to economizing and conservation has been made by the repair-service efficiency experts P. I. Morgachev (taxi motor pool No. 1) and A. I. Pozdnyakov (taxi motor pool No. 8).

It should be stated that the Mosavtolegtrans group is not satisfied with the results which have been achieved, and it is striving to further strengthen the conservation system. But, unfortunately, a more complete utilization of the existing reserves depends not only on it. Just take the equipment designed for testing the adjustment of the fuel fitting. It is still being turned out in an obsolete model and does not meet up-to-date requirements. To the present day scientifically grounded methodological developments for operating the fuel apparatus of carburetor engines have not been approved. Moreover, they would facilitate, to a large degree the effective utilization of existing diagnostic equipment.

It is well known that no kind of technical-service system can ensure a higher level of reliability than the level inherent in the given design of a motor vehicle. In this connection it should be noted that despite the improved design of the GAZ-24 motor vehicle and its modifications, expenditures for technical services have still remained significant. Thus, the proportion of expenditures for technical services and minor current repair of passenger cars amounts to 12--15 percent of the total outlays for maintenance and operation. It is also appropriate to pose the question of improving the fuel economy of taxis. The elimination of existing shortcomings, the correct solution to the problems of supplying spare parts, will allow the motor-vehicle transport workers to attain more tangible results in conserving petroleum products. And this is of enormous importance to the national economy.

COPYRIGHT: Izdatel'stvo "Ekonomika", "Material'no-tekhnicheskoye snabzheniye", 1980

2384

CSO: 1829

## RAILROAD

UDC: 656.211.5.072.1:681.3

### COMPUTERIZED RESERVATION SYSTEM DETAILED

Moscow ZHELEZNODOROZHNYI TRANSPORT in Russian No 10, 1979, pp 18-22

[Article by S. G. Kavan, Deputy Chief of the Central Railway Office for Passenger Service of the Moscow Railroad, and V. A. Timukhin, Chief of Department of the Computer Center of the October Railroad]

[Text] A unified direct reserved seat and preliminary order reservations system based on the YeS EVM [Unified computer system] has been developed and introduced to improve organization of passenger transport and to improve passenger service on railway transport. The new system will encompass all the large terminals with passenger flow of not less than 10,000 passengers per day.

The new progressive form of passenger service envisions sales of direct reserved seats and return tickets at points of departure based on seat reservation by telegram orders. The passengers at practically any stations of the system can order tickets at the ticket offices for trains dispatched from the Moscow terminal. This method was first introduced at the Central Railway Office for Passenger Service (TsZhB) in Moscow.

Orders for direct reserved seats on trains from Moscow stations were transmitted through the computer complex of the unified system and the Akkord-1200 data transmission equipment on 14 railroads in 1978 during the mass summer transport season. This made it possible to accelerate processing of orders and to increase allocation of seats by almost eight percent at the requests of the railroads during the summer season.

Introduction of an automated accounting and direct reserved seat system significantly reduced the time expenditures for fulfilling the requests of passengers, freed the TsZhB dispatchers from manual sorting of 40,000-50,000 seats per day, improved the working conditions of the advance and daily ticket sales offices and eliminated the necessity of punching tickets at the capital stations for transit passengers. However, the new technique for reception and fulfillment of direct reserved seat orders could not be used as a typical system for other large terminals. Moreover, the experience of operating the accounting and seat reservation system

showed that, along with standardization of problems, it should provide selection of different versions of solutions when fulfilling orders, automation of return tickets, calculation of the cost of passage, allocation of tickets in real time, receipt of all statistical reports for passenger transport, operational planning of transportation for the railroads and the system and analysis of operation.

In this regard the Main Passenger Administration and the Main Administration of Computer Technology of MPS [Ministry of railways] decided to develop the new standard ticket reservation system to formulate direct reserved seats and advanced requests based on modern computer technology. Specialists of the Moscow, October and Southern Urals Railroads and the Technological Planning and Design Office of ASUZHT [Automated Railway Transport Management System] developed and introduced the first unit of this system in the Moscow and Leningrad terminals. It envisions allocation of seats up to 45 days prior to train departure and issue of display lists on seat availability to the associated railway offices of the system (ODB) on trains dispatched from the Moscow and Leningrad terminals 30 days in advance. During 1979-1980 it is planned to introduce the system on eight additional railroads of the system and further step by step development of it is planned.

#### Main Problems and Elements of the System

Problems related to ticket reservations, computer input and correction of normative and reference information and gathering, storage and printout of data on terminal devices on debarkation of passengers at intermediate points for repeat use of seats, preliminary checking of order fulfillment, compilation of operational and counting data on operation of the system and introduction of a system archives are being solved within the typical automated system.

Direct ticket reservations are the main problem of the system. The input data for solving it are contained in the order which includes two types of requisitions. The first type includes data on the passenger's trip required for any order: the data of departure, the required categories and number of seats and the cipher of the station of destination. Requisitions of the second type contain additional information whose presence permits reduction of the number of refusals of ticket allocation (indication of the possibility of replacing a number or category of a train--up to three interchangeable trains), control information and the cipher of the type of requirement. The presence of special requests ciphers permits stipulation of the possibility of ticket reservation for other categories or for other days (in the absence of tickets for the requested train) when the order is transmitted and also to provide reservation of all seats in a car or of only lower berths.

Ticket reservation when indicated in the order, acknowledgement of a change in the number of the train, seat category and date of dispatch (for

a period up to three days) are accomplished in the following manner. If there is no seat of the given category in the requested train, the possibility of making available those same seats in another train is considered and their category is changed only after this. The day of departure is changed only if there are no available tickets for other trains and other categories. This technique permits more complete satisfaction of passenger requests.

Orders are divided into group (with more than nine tickets) and individual according to the number of reserved tickets. The reservation scheme for both types of requests is the same on the whole. The difference of group from individual reservation includes only the fact that one group of available seats in the same car is initially selected and if this is impossible, then 10 groups of seats are selected. Two groups of seats can be selected by individual requests. Then, if the seats in one car cannot be selected as requested, seats in other cars of the same type are selected--not more than in two groups for individual orders and not more than 10 groups in group orders.

An individual request is considered satisfied if all the requested seats are allocated for it and a group request is considered satisfied if the seats are allocated at least partially. The type of request and additional information (the number of the train and rail car, the category and number of return tickets and the number of the first ticket in the group) should be indicated in the request for allocated return tickets. The presence of a protective code in the request (return) makes it possible to check the reliability of data on the numbers of the train and car and the type of seats.

In processing the order, ticket reservation is envisioned primarily in trailer and conventional cars (if the ciphers of the station of destination on the request and the car from the normative and reference information coincide).

Tickets within the automated reservation system are distributed by types of sales: by direct reserved ticket, collective requests, for the offices of orders and so on. The conformity of orders to the allocated norm of tickets is checked by the code of the city or the codes of the ticket offices by means of special tables.

Requests for input into the reservation system are prepared on punch tape--manually or by computer. The control sum is additionally indicated in each line of the information messages used for this purpose. The presence of these data permits one to check the quality of message transmission over communications channels.

The format and logic checks of requisitions of initial messages are made prior to processing the orders and errors in the type of request, seat category and station of destination are determined.

The results of ticket reservation calculations are issued on punch tape for transmission over communications channels or are printed according to the format of boarding stubs. In this case the main requisitions of the information message--the date of departure, the numbers of the train and car and the ticket category--are printed twice. The quality of transmitting the lines of the message over communications channels can be checked by the control sum compared to the response data for orders.

The normative and reference information (NSI) is entered from the storage devices to the computer during ticket reservation. The NSI includes conditional-constant and variable information. Conditional-constant information contains data on the reservation deadlines for types of ticket sales, the number of terminals encompassed by the automated system, the lines, names and ciphers of stations of designation and record of passenger debarkation and the names of graphs of individual allocated forms. The possibility of input and printout of reference tables is envisioned for the conditional-constant part of the NSI. This type of information is corrected during preparation of the system to operate under specific conditions.

Data on trains which are corrected when a traffic schedule is changed or when trains are entered and postponed, comprise the variable part of the NSI. When variable information is entered in the computer, a format check is made and when it is entered by individual components a logic check is made. Data on trains by which data are corrected are entered in a special file, printed out and stored until the deadline for entry or cancellation of the train begins. Automatic correction of the seat norm is made after this. This approach to management of this most crucial information with timely input of messages permits a final check of it at the points of origin--the subdivisions of the passenger service and only then can it be used in the automated system with the least time expenditures.

Automation of ticket reservation requires clear checking of availability and sales of them. Solution of the problem of compilation of operational and accounting data on system operation for this purpose permits one to obtain objective information on seat availability in trains for the first 18 or all 45 days of the reservation period, a list of seat availability by lines and dates and the percent ratio between sold and available seats by dates, categories and trains. Accounting for reserved and cancelled seats by cities and orders with errors has been automated.

Solution of this problem makes it possible to improve the management of passenger transport and to designate and cancel additional trains on a more justified basis.

Development of a reservation system made it possible to automate such a laborious and crucial process as investigating deficiencies in work committed by passenger personnel. Management of the system archives has been

included in the complex of problems solved for this purpose. All data on fulfilled and cancelled orders and those unfulfilled due to nonavailability of seats are stored in the archives for one year. The archives are processed and information is issued on the occupation or availability of any seat allocated by the system by means of a special program.

The automated system ensures ticket reservation for different periods and types of orders. For example, orders for direct reserved tickets for the TsZhB of Leningrad are processed within a period from 45 to 7 days and collective orders are processed within a period from 45 to 19 days. The remaining tickets are then transmitted for subsequent automated sales or for manual sales.

When converting to manual sales, the information on seats for which the reservation deadlines have terminated is printed out from the computer by the schedule-chart format for rail cars. All available and reserved seats are noted on these schedule-charts.

The new system is directly related to the complex automated control system of ticket-office operations of the Moscow terminal Ekspress. All remaining tickets not used in the reservation system are transmitted to the Marshrut computer 10 days prior to train departure for sales in the ticket offices of TsZhB and branch offices.

A schedule of the system is compiled by means of special programs and the processes of input and erasure of train information in the computer complex storage is controlled.

Organization of advance check is included in the complex of problems solved by the system to check the correctness of order transmission. Format and logic check of the information in requests coming from the serviced area to other reservation systems is accomplished by means of this problem. Automatic sorting of requests is accomplished on the basis of lists of available seats transmitted from other systems. Requests for which there are no available seats are eliminated.

Accounting of seats available as the train progresses (more than 10 percent of the passengers usually end their trip at stations of debarkation) has been automated. Gathering of information from the accounting stations for each train for the entire reservation period is provided for this purpose on the basis of data on ticket reservation and cancellation. After the reservation deadline has terminated, data on passenger debarkation is sorted by the cities from which the orders came and are issued in special format on punch tape for subsequent transmission to the addressee.

All the problems of the automated system are closely related to each other. The results of solving the problem of input and correction of normative and reference information are used when entering requests and reservations for tickets. The responses are the basis for preparation of operational and

The passage document from the station of departure to the station of destination is formulated if the passenger does not have to transfer and a ticket for passage in the general car from the initial to the final station and two paid receipts up to the required category with seats (from the station of departure to the station of transfer and from the station of transfer to the station of destination) is formulated if it is necessary to transfer during the trip. If the passenger cancels the trip, the seat is transmitted to the LBK with indication of its check code.

The LBK punches all requests received from the stations and prepares telegrams which are transmitted to the railroad computer center directly to the computer or the teletype room. Responses to requests and lists of available seats on the system are issued from the computer center. Moreover, the requests of passengers, as in the ticket offices of line stations, are received here.

The operating technology of the ODB (TsZhB) is similar to the LBK. Moreover, the LDB determines the seat norm stored in the computer memory, establishes the reservation for this norm, checks the use of tickets, solves problems of operational planning of seat distribution and establishes the frequency and format of issuing an operational-reference report. The entire seat norm for the reservation points (within 45 days) is entered in the computer, data on changes in the layout of rolling stock and the travel routes of trains are corrected and so on. The seat norm is transmitted to the current sales ticket offices two days prior to train departure.

During formulation of a passenger request, the ticket agent records his number, date of departure, the station code, the type of request, the number and numbers of the interchangeable trains, the type and number of seats, the code of the station of destination and the passenger's name in a special log. The number of the request and the date of appearance for formulation of passage documents are communicated to the passenger.

Requests are entered in the log in the order of their receipt without selection by reservation points, dates and trains. The responses are recorded opposite the corresponding requests. The date of departure, the station code, the numbers of the train and rail car, the type of rail car, the numbers of the first and last tickets, the total number of tickets and the control sum of the response are indicated in the responses.

The following methods are used to check the quality of the information of preliminary documents: visual (the operator who punches out the request on the teletype compares the information on the teletype tape to similar data of the log), semantic (the ticket agent checks the corrections when responses for requests are received), logic and format checking of requests and responses by computer.

The requests for tickets are encoded, punched in the form of a model message and are transmitted to the computer center over communications channels.

accounting data, management of the system archive and accounting for passenger debarkation. Preliminary checking of requests and direct communications with other systems permit complex solution of all the problems and increase the reliability and productivity of the ticket reservation system.

The hardware complex of the system, along with the calculating devices, includes data preparation apparatus (the T-63 teletype), information reception and transmission by telegraph and telephone channels (telegraph apparatus and Akkord-1200PP devices). The possibility of readout and recording of information on magnetic tape by using the YeS-9002 apparatus coupled with the Akkord-1200PP is provided to accelerate information transmission and to increase the operational reliability of the system during data reception and transmission. The YeS EVM used in the system has been equipped with magnetic disc and magnetic tape stores and punch tape and punch card information input devices. The internal storage capacity comprises 256 kbytes.

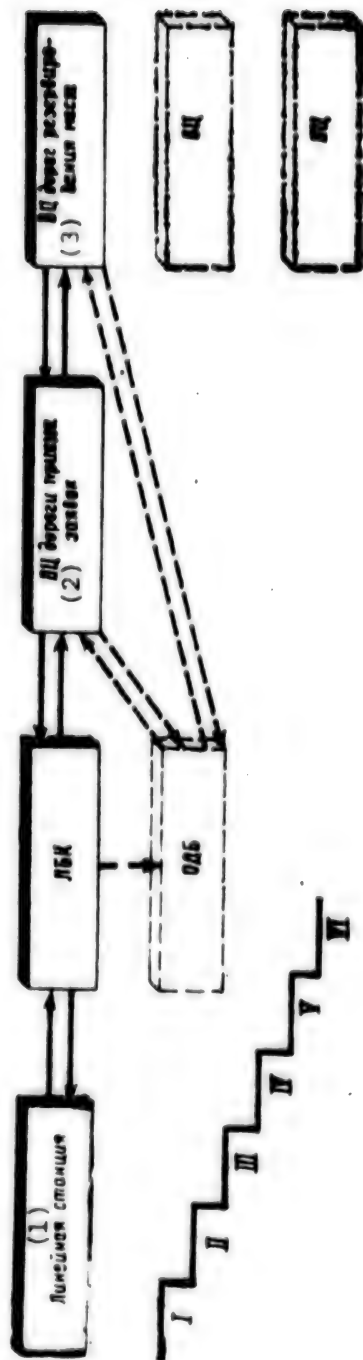
#### The Technology of System Operation

The automated train ticket accounting and reservation system mutually links the operating technology of of passenger stations, line ticket offices, combined railway offices and railroad computer centers for passenger request service.

Let us consider the overall scheme of functioning of the unified system. Passenger stations (LS) take requests and issue response for ticket reservations on long-distance trains. Line ticket offices (LBK) gather requests from the stations and formulate telegrams for transmission to the ODB or VTs and receive and transmit telegrams with responses to requests to the stations. The combined railway offices check the normative-reference information--the reference manuals of the stations and lines and the ticket norm on trains entered in the system. The computer center makes reservations according to the transmitted orders, issues reference data for checking ticket sales, makes an advance check of requests prior to issue of them to other systems and implements measures to increase the reliability of data during data transmission to other reservation centers.

Orders for formulation of train documents for direct reserved seats are received at the stations from 45 to 2 days prior to train departure. When a request is received, the ticket agent takes into account the total time required to obtain the seat and to formulate the ticket. Lists of ticket reservation points have been prepared by the passenger services for each station and the minimum required time to formulate passage documents at these points has been established. When a request is recieved, the ticket agent coordinates all the possible types of changes with the passenger and indicates not less than two interchangeable trains in the request. A special schedule has been developed to transmit orders from line stations and information on seat availability from reservation points.





Technological Process of Seat Reservation By Direct Reserved Ticket and Advance Orders: I--receipt of requests and issue of responses to requests; II--transmission of requests to LBK and transmission of responses to requests from LBK; III--encoding and punching of telegrams with requests, transmission of telegrams with requests to the computer center of the railroad in question; IV: 1--sorting of requests by railroads of destination; 2--logic and format checking of requests; 3--protection of requests by the control sum; 4--checking of seat availability; 5--logic and format checking of responses; 6--checking the control sum; V--transmission of requests to the ticket reservation computer center and transmission of responses from the computer centers; VI: 1--encoding of requests, logic and format checking of requests and checking the control sum; 2--request processing; 3--issue of responses and list of seat availability; 4--issue of operational and reference information; 5--miscellaneous operations.

Key:

1. Line station
2. Computer center of request receiving railroad
3. Computer center of ticket reservation railroads

A punched tape with encoded and punched requests is the machine information carrier. The corresponding time standards have been established for preparation of input information.

Telegrams or individual requests not accepted for processing are determined during the course of logic and format checking of primary documents entered in the computer. Messages on detected errors are transmitted to the request formulation points.

Processing of orders and solution of reservation problems in the computer center are divided into two steps: preparatory and main. The LBK and ODB requests are checked for reliability and completeness of information in the first step. They are then sorted by railroads of reservation and are checked for conformity of the requested seats to their availability. The control sum is added to the texts of the checked requests and the telegram is transmitted to the reservation computer center. The responses received after the check are transmitted to the LBK and ODB. Data on ticket availability at the reservation points arrive daily together with responses from the computer centers.

Requests arrive at the computer of the computer center reserving the tickets during the course of the main step of order processing. The following operations are carried out here: format and logic check of requests, ticket reservation, issue of responses and lists of ticket availability and operational-reference information, change of the date, ticket norm and preparation of the complex for operation during the next session.

Several request processing sessions can be carried out at the computer center as a function of the load level. The length of one session should not exceed 5-6 hours. The number of request processing sessions for each computer center is calculated according to the total volume of requests, computer productivity and the length of the session.

The input and output information is checked and corrected by means of computer or directly by operators (visual checking of operational-reference information entered in the computer by the ticket norm and changes made in it).

The length of request processing in railroad computer centers should not exceed 24 hours from the moment the request arrives until a response is transmitted. Information on orders is transmitted over communications channels. Operational-reference information arrives at the passenger service of the reservation railroad no later than 10:00 of the following day.

If the schedule is changed, the passenger service personnel transmit information for formulation of NSI files to the computer center not less than two months ahead. Operational changes in the files are entered in the computer not less than two days after the corresponding telephone call or

telegram has arrived. Correction of the ticket norm is permissible when trains are entered or cancelled, with changes of station of destination, the period of plying and the time of train departure, input and removal of rail cars from the train, changes of the ticket norm, categories, numbers of rail cars, stations of destination of rail cars with variable sign and trailer cars. All the NSI files are stored on magnetic tape at the computer center.

The automated ticket reservation system should be introduced in steps with connection of the corresponding points as they become ready.

The experience of organizing passenger transport at the Moscow and Leningrad terminals indicates the high effectiveness of the new system.

COPYRIGHT: Izdatel'stvo "Transport", "Zheleznodorozhnyy transport", 1979

6521

CSO: 1829

## RAILROAD

UDC [656.012.011.56:656.2].003.13

### SAVINGS REALIZED BY USE OF COMPUTERS

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 10, 1979 pp 62-65

[Article by A. P. Abramov, doctor of economic sciences, N. N. Barkov, doctor of economic sciences, L. N. Ivanov, candidate of economic sciences, L. A. Titova, candidate of economic sciences, and N. A. Yandolovskiy, candidate of economic sciences]

[Text] Computer introduction on railway transport has achieved large scales. The first unit of the automated railway transport control system (ASUZhT) has now been introduced.

Approximately 1,000 problems of more than 200 designations is now being solved in railway transport computer centers. Approximately half of them are related to fulfillment of functions of transport organizational control and the remaining part are related to production processes. The former include problems in the field of planning, normalization, accounting, monitoring and analysis. Part of the solved problems is optimization in nature (development of schemes for normal directions of freight traffic volume, the forming-up plan and train traffic schedules and some others).

A significant increase of computer use in railway transport by expansion of the range of problems solved in the ASUZhT, especially production-optimization problems, development of information and reference systems, including dialog-reference systems, and also data transmission equipment, is being provided during the current five-year plan and in the future.

The purpose of existing and newly developed automated systems and also the individual problems solved by using computers is improvement of railway transport management based on increasing the effectiveness of production and economic activity of the railroads and their line subdivisions, optimization of the shipping process and operational control of shipments, increasing the operational level of all subdivisions of railway transport, repair enterprises and subways, improvement of operational-statistical and bookkeeping accounting and other types of economic activity.

Further development of the ASUZhT requires large capital investments to acquire hardware and also current expenditures to ensure functioning of the systems. Capital investments to development of ASUZhT comprised 74 million rubles during the Ninth Five-Year Plan, while this sum should be increased twofold during the 10th Five-Year Plan.

The temporary Method of determining the economic effectiveness of automated control systems and problem-solving using computers in railway transport has been developed at the All-Union Scientific Research Institute of Railway Transport and has now been confirmed by the Ministry of Railways for more efficient use of the funds allocated for development of the ASUZhT. It was compiled on the basis of the Method of determining the economic effectiveness of automated enterprise and production association management systems, confirmed by the State Committee of the USSR on Science and Technology, Gosplan of the USSR and the USSR Academy of Sciences in 1978, and also the Procedural instructions to determine the economic effectiveness of new technology, inventions and inventors' proposals in railway transport, confirmed by MPS in 1978.

Let us consider the main propositions of the temporary procedure.

#### Efficiency Indicators

The saving from introduction of automated systems in railway transport is determined by the increase of railroad profits due to additional freight shipments as a result of optimizing the use of shipping facilities, by saving current expenditures through reduction of consumption of material and labor resources in the production sphere and by reducing labor expenditures during data-gathering and processing related to the problems being solved. The results of functioning of automated systems and introduction of the corresponding problems should be reflected in the production activity indicators of railroads and their line production subdivisions.

A significant saving from introduction of the ASUZhT has also been achieved outside transport. Its sources are an increase of the rate of freight delivery and the saving of passengers' time, more efficient shipments, an increase of freight preservation, a reduction of expenditures for tare and packing with an increase of container shipments and so on.

The index of the annual saving and also the cost-accounting indices of efficiency--the annual increase of profits (saving of expenditures) and the calculated coefficient of the effectiveness of capital investments (or the inverse value--the payback period)--are used to estimate the effectiveness of expenditures to develop ASU [Automated control system] and to solve problems or complexes of problems by using computers. Each of the named indices performs the functions inherent to it.

The index of the annual saving is designed to select the versions of new equipment, including development of ASU, and also for calculating the

bonuses for new equipment for development and introduction of ASU. This index is calculated by the following formula:

$$S = \sum C_i \pm C^A + E_n (K_i - K^A) + E_{nh},$$

where  $S_i$  is the reduction of annual operating expenses for  $i$ -th element of expenditures in the operational sphere,  $S^A$  is variation of the annual current expenses related to information processing, the saving (+) and increase of expenses (-),  $K_i$  is the saving of capital investments in the operational sphere for the  $i$ -th element of expenditures,  $K^A$  is capital investments related to introduction of the evaluated ASU (or problems using computers),  $E_{nh}$  is the annual saving achieved outside transport and  $E_n$  is the normative coefficient of the economic effectiveness of capital investments in new equipment ( $E = 0.15$ ).

The basis for comparison is the corresponding indicators of expenditures in the absence of ASU, but with regard to a possible increase of the technical level of production and the volume of shipments (operations) assimilated during the year of calculation in the presence of ASU. The year of calculation is understood as the year following introduction of a system into operation. Many factors affect variation of the indices and if the effect of the ASU on these indices cannot be evaluated directly, the variation is determined on the basis of the calculating procedures or by using data of similar problems or expert analyses already introduced and also the corresponding norms of expenditures related to these indices.

The index of the annual increase of profits (saving of expenditures) used to evaluate the economic results due to development and functioning of ASU or solving individual problems and complexes of problems using computers in the cost-accounting indices of the operations of railroads and their subdivisions is calculated by the formula:

$$\Pi^A = \sum C_i \pm C^A + \Delta \Pi,$$

where  $\Delta \Pi$  is the increase of transport profits due to additional freight shipments as a result of releasing shipping resources during the year.

The achieved increase of profits is established on the basis of comparison with the expenditure indicators of the following year after introduction of the ASU (or problems and complexes of problems using computers), but without regard to the effect of the ASU.

The basis for the increase of profits due to additional shipments is the increase of freight traffic volume provided in the plans. The release of freight cars achieved as a result of optimization of transport processes is taken as the synthesizing index of release of shipping resources.

The calculated coefficient of economic effectiveness (or payback period) is designed to determine the effectiveness of capital investments in development of ASU (solution of individual problems or complexes of them using computers) and is established by the following formulas:

$$E_p = \frac{\pi^A}{K_A^A} \geq E_{\text{нв}}; T = \frac{K_A^A}{\pi^A},$$

where  $E_p$  is the calculated coefficient of effectiveness of capital investments for development of ASU,  $K_A^A$  is the capital investments for development of an ASU without regard to preproduction expenditures not included in the cost of the main production funds,  $E_{\text{нв}}$  is the normative coefficient of the effectiveness of capital investments to development of the ASU and solution of problems by using computers (it was established as 0.33 for railway transport) and  $T$  is the payback period in years.

#### Determining the Production Effect

The production effect due to functioning of an ASU in railway transport is expressed in improvement of the use of rolling stock, equipment and permanent facilities and a reduction of the contingent of workers and a saving of fuel, electric power and materials.

Solving production-optimization problems will ensure a reduction of all or part of the named types of labor and material resources. The use of computers in solution of accounting-statistical problems leads to a reduction of the labor expenditures of personnel engaged in processing accounting-statistical information and also to a reduction of its processing times. All this in the final analysis improves the operational and production activity and ensures a saving of production resources.

Variation of the full-scale quantitative indices must be determined to calculate the production effect. Thus, variation of the operational indicators of the locomotive and rail car fleet is established to solve problems related to shipping activity. A reduction of the idle time of rolling stock for repair, a saving of material and labor resources and also better use of the production funds of repair enterprises are determined to evaluate the results of solving problems related to repair and routine maintenance of transport hardware.

Variation of full-scale indices as a result of introduction of ASU or solution of individual problems by using computers can be established at the pre-planning and planning stage of development on the basis of the corresponding engineering calculations and economic-mathematical methods and also data which characterize the effectiveness of already introduced similar ASU or of individual problems. If the required data at the initial stage of calculations are absent, variation of one or another indices can be determined for calculation of the production effect through expert

analysis. The results from introduction of systems or problems should subsequently be refined on the basis of analyzing the actual variation of the corresponding indicators.

If the effect in the form of variation of qualitative indicators is known, it must be expressed in monetary evaluation in variation of quantitative (volumetric) indicators--time indicators (variations of rail car-, train-, container- and locomotive-hours of train, marshalling yard and mileage indicators: rail car- and locomotive-kilometers of a single run). This recalculation is made on the basis of traditional formulas.

The saving of current expenses and capital investments achieved as a result of better use of rolling stock is determined from these indicators and by the consolidated norms of expenses for each of the calculated measures. In this case, capital investments are applied to the calculation only for the annual saving.

When determining the increase of profits and the calculated coefficient of the effectiveness of capital expenditures for development of an ASU (or the corresponding payback period of these capital investments), only the saving of current expenses related to reduction of the value of the measures, except for variation of rail car-hours, is calculated.

The saving of rail car-hours is used in the given case to calculate the increase of profits due to additional freight shipments. As noted above, the method of determining the economic effectiveness of ASU introduction provides for analysis of the return of capital investments in development of the ASU not only due to profits from reduction of expenses, but also due to the additional volume of products. For ease of calculations, profits may be related to any one measure of operation, for example, for the "rail car-hours" measure, to which the volume of shipments is closely related. The value of additional profits achieved with an increase of shipments as a result of acceleration of rail car turnover can be calculated per one rail car-hour on the basis of the average daily productivity of a freight car, the profitable rate per 10 ton-kilometers and the cost of freight shipments dependent on the volume of operation.

If the fraction of dependent expenses is equal to 0.4-0.5 under conditions of current planning, the mean value of additional profits per one rail car-hour is equal to approximately 90 kopecks. However, the possible reduction of the productivity of rail cars used for additional shipments must be taken into account due to an increase of empty runs compared to the average value of delays related to unpreparedness of the locomotive fleet for additional shipments. Therefore, it has been decided to take two-thirds of the additional profits per rail car-hour, i.e., 60 kopecks for calculation.

A reduction of container-hours creates the possibility of additional switching of freight shipments to the container method of delivery. Since

an increase in the volume of container shipments may occur due to small and rail car dispatches, the cost of shipment of which in box cars is a different ratio to the cost of container shipments, it has been decided not to take into account variation of profits in part of shipping operations in the given case, but to determine only the reduction of expenses for loading-unloading operations.

For approximate calculations, the saving for loading-unloading operations can be taken as equal to two rubles for each ton of freight additionally shipped in containers.

The results of solving problems expressed in reduction of the mileage of freight cars (elimination of turn arounds, reducing empty runs and so on) are evaluated by the consolidated rate of expenses per unit mileage (1,000 rail car-kilometers). Unlike the unit expense rate per rail car-kilometer, which includes only expenses for inspection and routine repair of rail cars, the consolidated rate should include all expenses related to movement of rail cars in trains and handling of them at servicing yards.

Many consolidated expense rates for measures of rail car and locomotive operation can be taken from data available in the economic reference manuals compiled on the railroads and many divisions for calculations under specific railroad conditions.

When evaluating the results of solving problems related to improvement in organization of repair and improvement of the use of station equipment, the savings should be determined by direct calculation on the basis of the norms of equipment utilization, expenditures of labor and material resources and deductions for depreciation of basic funds.

In the absence of norms, the input data can be taken from the results of analyzing actual expenditures. The monetary expression of this effect in the form of the annual saving should be determined on the basis of existing prices, wage rates and the dimensions of additional payments.

The real production result cannot be calculated for some accounting-statistical and information-reference problems since the problems have not been solved. The conditional effect measured by the achieved saving of labor related to gathering and processing of the corresponding information and output of finished data as a result of using computers can be determined in this case compared to the extent to which labor would have to be expended to achieve these same data in the absence of computers.

#### The Non-Transport Effect

As already indicated, the non-transport effect, which is not expressed in economic indices of its activity due to the characteristics of transport as a sector of material production, and of the achieved effect is formed in many cases as a result of developing automated systems and introduction of computers in railway transport

Besides the saving of transshipping facilities, acceleration of freight movement and a reduction of circulating funds of the national economy are achieved by reduction of rail car-hours. The achieved monetary saving is estimated by the known formula on the basis of the average price of one ton of shipped freight, the average load of the rail car and reduction of the rail car-hours of freight cars. If the name of the freight by which acceleration of movement is achieved is known, the price is taken as equal to the wholesale price of the given freight.

When the section speed of passenger trains is reduced, we feel that one should take into account the saving of passenger time achieved from this in passenger-hours annually and the saving achieved in the national economy should be established through the monetary estimate of one passenger-hour. According to calculations based on the estimate of the cost of the national income per one calendar hour per capita and with regard to the fact that the most active part of the populace makes use of transport to the greatest extent, one passenger-hour can be estimated as equal to 30 kopecks under modern conditions.

When solving optimization problems related to making freight shipments more efficient and reduction of their mileage, a reduction of consignor expenses is achieved for the corresponding haulage rates. At the same time railway transport loses a specific part of profits due to shipments. In total, the national economy achieves a saving due to elimination of inefficient shipments in an amount equal to the saving of current railroad expenses (reduction of haulage rates minus the loss of profits).

If the volume of containers and the saving of container-hours achieved from this is accelerated, it is possible to ship additional freight in containers. Thus, the national economy achieves a saving of expenses for transport tare and also a reduction of circulating funds with regard to acceleration of freight movement in containers.

The saving of expenses for tare can be calculated from the mean productivity of the container per year in tons and the saving of expenditures for transport tare calculated for one ton of freight switched to the container method of delivery. This value comprises an average of 18.5 rubles/ton and depends on the type of freight.

The saving of expenditures outside transport is taken into account when determining the annual saving. When estimating the cost-accounting indices of effectiveness, this effect is not expressed in the profit achieved. Therefore, it should be taken into account additionally together with the increase of transport profits or "as a balance" in order to have a proper idea of the total effect due to introduction of the ASUZhT.

#### Calculating Variation of Expenditures for Information Processing

Variation of current expenses for processing input information used in solution of production and accounting-statistical problems based on

computers is established by comparing expenses with existing methods of obtaining data and automated systems.

The existing technique of obtaining data combines in itself different methods of information processing and related expenditures on information processing by hand and on keyboard and perforation calculators. With automated information processing, routine expenditures include the cost of manual processing (encoding, recording of indices and other manual operations), preparation of input information carriers and checking of them, information transmission to the computer center and return by users and automated information processing. The volume of operations for computers is measured by the amount of input information in thousands of characters and also by the machine time of problem-solving.

The saving of routine expenditures for information processing is determined as the difference between the annual routine expenses with existing methods of information processing and those when using computers. One-time expenditures for development and introduction of automated control systems consists of pre-production expenditures and capital investments for development of ASU.

Pre-production expenditures include expenses for scientific developments on ASU, including development of algorithms and programs, tie-in of standard planning decisions, experimental operation of the system, training and retraining of personnel and so on. Capital investments in ASU include the cost of acquiring the computer equipment, peripherals, means of communications and construction of buildings and structures.

When determining the economic effectiveness of solving individual problems, the capital investments in computers are taken as proportional to the fraction of machine time required for a given problem from the total annual budget of useful computer operating time. Expenditures for communications equipment are calculated in proportion to the volume of information transmitted over communications channels with respect to the total volume of ASU information as a whole.

In those cases when capital investments for development and introduction of ASU are realized over a number of years and operating expenses for maintenance of ASU vary due to variation of operating conditions by years of operation, the economic effectiveness of the ASU should be determined with regard to the time factor.

#### The Results of Calculations

Based on the developed procedural propositions, experimental calculations were made to determine the economic effectiveness of some automated systems and individual problems solved by using computers (see table).

|                                                                                                                        | Annual saving, thous. rubles | Annual Increase of Profits, thous. rubles |                                                         | Calculated Coefficient of Effectiveness, percent |                                                         | Period of Return, years |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|---------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|-------------------------|
|                                                                                                                        |                              | Within transport                          | Within transport with regard to the nontransport effect | Within transport                                 | Within transport with regard to the nontransport effect |                         |
| Classification yard ASU                                                                                                | 192.7                        | 449.2                                     | 553.7                                                   | 36.7                                             | 45.3                                                    | 2.7                     |
| Processing the information of railroad agencies in three calculation-commercial offices                                | 61.7                         | 106.9                                     | 106.9                                                   | 52.0                                             | 52.0                                                    | 1.9                     |
| Calculation of wages at the locomotive depot                                                                           | 4.6                          | 7.3                                       | 7.3                                                     | 50.0                                             | 50.0                                                    | 2.0                     |
| Calculation of monthly freight shipment plans on the railroad                                                          | 80.5                         | 33.6                                      | 94.9                                                    | 210                                              | 530                                                     | 0.5                     |
| Handling the unit trains of the engineer on the railroad                                                               | 64.8                         | 109.8                                     | 109.8                                                   | 50.0                                             | 50.0                                                    | 2.0                     |
| Technical diagnosis of predicting the mileage of diesel locomotives between repairs by using computers on the railroad | 355.3                        | 387.0                                     | 387.0                                                   | 190.0                                            | 190.0                                                   | 0.52                    |
|                                                                                                                        |                              |                                           |                                                         |                                                  |                                                         | 0.52                    |

The data indicate the very high economic effectiveness of using computers and introduction of the considered automated systems in railway transport.

The essential factor for analyzing the effectiveness of some problems is taking into account the nontransport effect. Specifically, the main effect for container terminal ASU which determines the feasibility of introducing it is created outside transport with regard to the possibility of achieving a saving for tare and the freight mass enroute due to a saving of container-hours and an increase of container shipments. The nontransport effect is also formed with introduction of classification yard ASU and when using computers to calculate the monthly freight shipment plans. In the latter case this effect is formed as a result of eliminating inefficient freight shipments.

Besides the monetary indices of effectiveness, full-scale indices can also be estimated. Thus, by knowing the achieved reduction of man-hours of working time and the annual fund of this time per worker, one can establish the average reduction of the contingent. The saving of the contingent comprises 31 persons in the considered example of a classification yard ASU. This saving will be equal to 99 persons in the problem related to processing of railway agencies and it will be equal to 18 persons when calculating the monthly plans on the railroad. The saving of the operating rail car fleet can be calculated by dividing the released rail car-hours by the number of hours annually (8,760). This saving comprises 124 rail cars in the problem for classification yard ASU.

The use of the considered procedural propositions under diverse conditions of using computers in railway transport permits one to make technical and economic calculations for each specific case. These calculations will contribute to economic expenditure of funds directed toward acquisition and functioning of computer equipment and also to an increase of ASUZhT efficiency.

COPYRIGHT: Izdatel'stvo "Transport", "Zheleznodorozhnyy transport", 1979

6521

CSO: 1829

## RAILROAD

### BRIEFS

BAM ROUTE GEOLOGICAL MAP--A geological map of the BAM railway route, which has been compiled by the Far Eastern Scientific Center of the USSR Academy of Sciences, shows exact locations of mineral deposits in the area. The map covers an area of some 1.5 million square kilometers and is the first step in a detailed study of the railway zone. The map will be used as a basis for compiling an atlas, which will include geophysical, geological, economic, forecasting and other maps of the region to enable the industry to make use of new types of minerals. [Vladivostok Maritime Service in Russian to the Pacific Far East 0710 GMT 25 Mar 80 OW]

CSO: 1829

## OCEAN AND RIVER

### MINISTER OF MARITIME FLEET DISCUSSES FLEET'S PERFORMANCE

Moscow VODNYI TRANSPORT in Russian 19 Jan 80 pp 1-2

[Article by T. B. Guzhenko, Minister of the Maritime Fleet USSR:  
"Pursuing a Course of Efficiency and Quality"]

[Text] The November (1979) Plenum of the CC CPSU and the Second Session of the USSR Supreme Soviet totalled up the results of 1979 and of four years of the five-year plan. Our country has taken a large new step in its economic and social development. The volume of industrial output during the four years increased compared to the same period of the Ninth Five-Year Plan by 600 million rubles. Real per capita income in 1979 exceeded the 1965 level by 1.9 times, and payments and benefits from the social consumption fund by 2.3 times. There was a large increase in the number of families with incomes of more than 100 rubles per month per person. During the last 15 years more than 160 million people moved into new apartments and improved their living conditions. Around 1.3 million square meters of housing will be received by the workers of our branch during the Tenth Five-Year Plan.

In carrying out the decisions of the 25th CPSU Congress and the 10th Session of the USSR Supreme Soviet regarding the economic and social development plan for 1979, in the fourth year of the five-year plan the workers of maritime transport fulfilled the coastal trade plan by 103.4 percent and the foreign trade plan by 103.9 percent.

Despite the exceptionally severe ice conditions in the Arctic waters, the seamen of the Murmansk, Northern, and Far Eastern Steamship Companies shipped all ordered cargoes to the points of the Arctic, Far North, Yakutsk ASSR, and to Cape Kharasavey and Dudinka.

Successful work was done by the workers of the branch in the fourth year of the five-year plan to ensure the performance of the constantly growing shipments to Cuba and Vietnam. Our seamen provided our economy with substantial amounts of grain, sugar, equipment, metal, chemical and other cargoes, and large-diameter pipes for the construction of petroleum

and gas pipelines, and also increased exports of transportation services. The plan for passenger hauls was fulfilled by 104.3 percent.

Although in a number of cases they possessed very limited port capacities, our port workers were able to cope with their loading and unloading work plans by bringing the level of overall mechanization to 93.2 percent. The introduction at 36 transportation centers of a system of continuous planning on a basis of intercoordinated schedule-plans for the work of related organizations had a decisive influence on the positive work results of the ports. It made it possible to reduce ship processing time by 5 to 6 percent, car processing time by 7 to 12 percent, and truck processing time by 15 to 20 percent. Labor productivity at loading and unloading work came to 103.3 percent.

The profits plan for all types of activity was fulfilled by the branch by 102.2 percent. Its basic qualitative indicators were also fulfilled: profitability exceeded the assignment by .44 points and return on capital by .86 kopeks, or by 2.6 percent.

The past year was a year of a further development of the material and technical base of the branch. The amount of fixed capital which was commissioned came to 1,075,400,000 rubles, including 800 million rubles which were spent on the fleet. The transportation fleet was reinforced with 37 ships with a deadweight of 978,600 tons. Among them were the gas carriers of the "Mossovet" type, container ships with verticle and horizontal loading and unloading methods, bulk-container ships for work in the Arctic of the "Dmitriy Donskoy" type, tankers of the "Palmiro Togliatti" and "Velikiy Oktyabr'" type and others. New and reconstructed wharves, warehouses, terminals, docks, and loading and unloading mechanisms and dozens of ships of the auxiliary service and port fleets were commissioned at our ports and plants.

The results of the development of the branch for the four years of the Tenth Five-Year Plan show that the production assignments for the overall annual plans are being fulfilled by the enterprise collectives of maritime transport for most of the basic indicators.

During the four years of the five-year plan the fixed capital for the basic operations work of the Ministry of the Maritime Fleet increased by 41 percent and now comes to more than 13.5 billion rubles, and the dead weight of the transportation fleet increased by 19 percent and exceeded 18.4 million tons at the beginning of 1980.

The positive outcome of the work of maritime transport to fulfill the plan for 1979 and the four years of the five-year plan is the result of the highly conscientious and skillful labor of the workers of all of

the specialties and all of the elements of the branch under the leadership of the party, economic, trade union, and komsomol organizations of the fleet and the shore. It is the result of the purposeful and planned combination in economic practice of the achievements of scientific and technological progress and the advantages of the socialist method of production.

The scientifically substantiated and experimentally tested overall system of organizational and technical measures which were realized during the years of the five-year plan serves as a confirmation of the correctness of this conclusion. The most important ones of them are: a system for the training and retraining of cadres on all levels -- from the worker to the minister -- which makes it possible to constantly maintain the qualifications of cadres on a modern level of production organization, management, and technology; and an improvement of the structure of the management and organization of production involving the introduction of complexes of tasks for the "Morflot" automated management system. These include, above all, an optimization of the work of the primary labor collectives -- overall, consolidated overall, and overall cost accounting teams of docker-mechanization specialist and ship repair workers, -- standard norms for the established size of crews, cost accounting operational ship crews, and continuous schedule-plans for the work of ports, the fleet, and transportation centers on the basis of scientifically substantiated norms and advanced experience.

Reflecting an objective characteristic of the transportation process -- its continuity -- and also its chief complexity -- the ensuring of efficient work at the junctures of various types of transportation in the transportation centers where not only transportation departments but also numerous clients interact, -- the continuous schedule-plan for the work of a transportation center which is computed on a computer in accordance with a special program represents both today and in the distant future a very important managerial instrument for effective transportation services for the economy. It makes it possible without additional capital investments and labor resources by making use of the advantages of socialism to substantially increase the effectiveness of the work of transportation, greatly shorten the time involved in delivering cargoes to consumers, and thereby to reduce economic transportation costs and the amount of commodity masses which are frozen in transportation.

The introduction of the continuous schedule-plan for the work of a transportation center has created favorable conditions for the development of overall socialist competition -- a genuinely effective competition with commitments for each of the collectives and individual workers participating in it which are economically and normatively substantiated and which lend themselves easily to verification and objective evaluation.

A no less important measure than the two previous ones is the use of the latest achievements of domestic and foreign science and practice in forming and developing the material and technical base of maritime transport.

During the years of the Tenth Five-Year Plan there was an active development of foreign economic relations with all states on an equal and mutually advantageous basis. They were most fruitful in the relations with the socialist countries both in the field of shipments and bilateral scientific and technical cooperation and with regard to the concrete problems of the realization of the Overall Program for a Further Deepening and Improvement of Operation and for the Development of the Socialist Economic Integration of the CEMA Countries.

Special mention is deserved by the modern progressive transportation systems which have been put into operation and are successfully operating: railroad ferry communications between the USSR and the People's Republic of Bulgaria involving the use of the world's largest ferries which take on 108 four-axle railroad cars; and the international cost accounting "Interlikhter" Shipping Enterprise which performs international Danube-sea shipments and whose stockholders and founders are the USSR, the People's Republic of Bulgaria, the Hungarian People's Republic and the Czechoslovakian Socialist Republic. Successful work is also being done by the Soviet-Bulgarian "Dunaytrans" Society which organizes and coordinates freight flows and the use of river tonnage in bilateral shipments.

In analyzing the results of the fulfillment of the plan for 1979 and for the four years of the five-year plan and in determining the tasks of the plan for 1980 and for the five-year plan as a whole and how to accomplish them, it is necessary first of all to make a critical analysis of the fullness and the efficiency of the use of the material and labor resources which are at our disposal.

In 1979 the length of the operations period came to 337.9 days for the dry cargo fleet compared to the planned 337.8, to 329.8 days for the tanker fleet compared to the planned 326.3, and to 354.1 days for the combined fleet compared to the planned 323.3. The USSR Class Register has 99.9 percent of the ships. Ninety-two percent of the fleet is covered by a system of continuous technical servicing. As a result of an economy of the repair time budget around 40 million additional tonnage-days were put into operation.

This data shows that the workers and specialists of the fleet, ship repair plants, technical service bases, steamships, the GKHO [expansion unknown], and the central apparatus who are employed in the sphere of technical operation are doing quite well with the tasks that have been

given them. If, however, one were to analyze the work of each of the steamship companies, cost accounting ship operational groups, or of individual ships, one could discover many shortcomings and unutilized reserves in this sphere.

According to the reporting data for ten months of 1979, the proportion of running time as the chief creator of transportation output exceeded the planned assignment only for combined ships -- petroleum-bulkers which produce only 4.3 percent of the tonnage-days in operations. But for the basic mass of the remaining dry cargo and tanker fleet this indicator is lower than the plan by one to two points. The reason here is in the failure to fill the planning assignment for a decrease in non-productive stoppages by the fleet in ports both for objective and for subjective reasons which depend upon shortcomings in the planning and management of the movement of the fleet and of its processing in ports and in composing and carrying out continuous schedule-plans for the work of the fleet, continuous schedule-plan for the work of ports, and scientifically substantiated norms and advanced experience.

The problem of providing ports with railroad cars remains the most difficult one. Although, on the whole, the fulfillment of the plan for the delivery of railroad stock has improved somewhat, it nevertheless comprises only 80.5 percent of the plan and is insufficient for non-stop unloading of ships, especially with food cargoes which follow the direct ship-car variant.

In the ports of Ventspils, Klaypeda, Tallin, Odessa, Il'ichevsk, Reni, Nikolayev, Kherson, Zhdanov, Vladivostok, Nakhodka, and Vanino there is a systematic accumulation of above-norm remainders of cars with export and transfer cargoes. And this is occurring because there still does not exist the necessary coordination in the work of the fleet, the ports, and the railroads.

Or take the question of unloading railroad cars. It is clear that the delivery of rolling stock for loading cannot be demanded if the unloading of cars which come into the ports with freight is not insured. But the accumulation of cars is, as a rule, the result of a disbalance between freight being brought into the ports and its being taken out by sea. The trouble is that we are creating this disbalance ourselves -- sometimes, it is true, not without the help of the Ministry of Foreign Trade.

A number of steamship companies, not without the knowledge of the GKHO, commit serious violations of the delivery schedule for ships for the removal of export cargoes, which leads to the accumulation of loaded cars in the ports of the steamship companies and to the piling up and stoppage of ships with imported cargoes, including foreign ships. This

situation has also become possible because of the UEF and P [expansion unknown] and its divisions do not ensure the necessary control over the work of the GKhO.

The fulfillment of planning assignments by the collectives of ship repair plants came to 100.7 percent for the production of output in terms of normed processing cost, 101.5 percent for labor productivity, and 100.1 percent for profits. Throughout the entire year most of the plants had a smaller working contingent than was called for by the plan. Matters are especially bad at the Kanonersk Ship Repair Plant and the Odessa Ship Repair Plant in the 50th Anniversary of the Soviet Ukraine whose working contingent has been decreasing from year to year, and also at the Il'ichevsk. Ship Repair Plant in the 50th Anniversary of the USSR, the Chardzhou Ship Repair Plant, the "Krasnaya Kuznitsa" Ship Repair Plant, and a number of other plants.

As a result of a lack of control by the GKhO and the steamship companies, in 1979 substantial plant capacities and material and labor resources were diverted for unplanned repairs on the fleets of other ministries and departments.

In the field of capital construction the 1979 plan failed to be fulfilled for the amount of capital investments, for the amount of construction and installation work, and for the commissioning of fixed capital.

The administration for the development of capital construction, the GKhO and the steamship companies did not show sufficient effort and attention to the achievement of the planned frontiers. The capital construction plan was not fulfilled by the Black Sea, Novorossiysk, Caspian, Far Eastern, Sakhalin, Kamchatka and Central Asian steamship companies and by the Administration for Instructional Institutions, although the plan for the four years was fulfilled for construction and for the commissioning of coastal objects and complexes.

The situation with the construction of housing is completely unsatisfactory. Of 102 houses which were supposed to be commissioned in 1979, seven were not planned for commissioning by the contractor, and five were very late in their construction and their commissioning did not take place. The commissioning of housing space has not been ensured in the Estonian, Black Sea, Sakhalin, Central Asian, and certain other steamship companies. Insufficient work is being done on the construction of objects provided for by the "Overall Plan for an Improvement of Working Conditions and Hygienic and Health Measures of the Ministry of the Maritime Fleet for 1976-1980."

The financial indicators of the ministry's work could have been better if there had not been unproductive expenditures and losses which for basic

operational activities alone came to more than 25 million rubles for nine months of 1979. The largest of them were: fines -- 3.8 million rubles, losses from a failure to safeguard cargoes -- 3.2 million rubles, and losses from accidents and accident repairs -- 5.1 million rubles.

The situation connected with ensuring the safe shipment and transshipment of cargoes is very worrisome. Many different rules and good orders and instructions on this question have now been created; however, good control over their execution has not been established.

In September of last year the Committee for Party Control at the CC CPSU checked the safekeeping of cargoes in the Odessa port. The situation is terrible. The chief of the Black Sea Steamship Company, his deputies, and the chiefs of the Odessa and Il'ichevsk ports did not take measures to eliminate the causes and conditions which engender shortfalls and the spoilage and theft of cargoes.

The hoisting service is badly organized in the ports with the result that during the loading and unloading there are frequent gross miscalculations and shortfalls occur. At the same time, uninventoried cargoes are found at the warehouses of these ports. At some ports and port dining rooms vodka is sold, a good watchman service has not been set up, and conditions have been created for the unimpeded entry into the ports of a large number of personal automobiles.

In the decree of the CC CPSU and USSR Council of Ministers on improving the economic mechanism it is stated that in the 11th Five-Year Plan the team form of organizing and paying for labor is to become the basic one.

However, in most of the ports of the GKHO "Yuzhflot" and "Sevzapflot" little has been done to introduce cost accounting and team contracting. In the ports of the GKHO "Dal'flot" more than 80 percent of the port workers are members of overall teams, but the initiator of the introduction of consolidated overall teams -- the Il'ichevsk Port -- has only 65.4 percent of its port workers in consolidated overall teams.

The situation is no better in the Arkhangel'sk, Odessa, Kherson, Krasnovodsk, and a number of other ports. In the Termez Port there is only one team which is regarded as consolidated and it has 15 people in it.

At the industrial enterprises 64.8 percent of the workers are covered by team forms of labor organization. The worst work in introducing collective forms of labor organization is being done at the enterprises of the Caspian and Central Asian Steamship Companies.

The situation is not good with the dissemination of the work experience of the consolidated overall team at the Odessa Ship Repairing Plant imeni the 50th Anniversary of the Soviet Ukraine of V. Vasil'yev -- now a winner of the USSR State Prize. But this experience has been approved and recommended for wide introduction not only by the Board of Ministry and the Presidium of the CC of the Trade Union, but also by the USSR State Committee for Labor and the All-Union Central Council of Trade Unions.

At the present time the branch possesses a sufficient number of specialists who have deep professional knowledge and a high level of moral and political and personal qualities and who are capable of successfully accomplishing the tasks of further increasing the efficiency of the work of maritime transport.

The increased equipment supplies for the fleet, the ports, and ship repair plants and the new and more difficult tasks facing the maritime fleet, especially this year as the result of the discriminatory actions of the United States demand from us a further improvement of all of our work with executive and command cadres.

We cannot be satisfied with the state of discipline in the fleet. The number of violations of labor discipline, of the rules of behavior for a Soviet seaman abroad, and of customs rules continues to be high. These violations lead to substantial material and moral losses.

Serious worry and anxiety is being caused by the state of discipline among the command -- the chief organizing force in the fleet. In recent years the number of commanders who have committed various misdeeds and received disciplinary penalties has not decreased and comes to around 40 percent of the total number of violators.

The lack of the necessary exactingness and control and of an atmosphere of intolerance toward all infractions is leading to the fact that in certain steamship companies there are frequent instances of the abuse of one's official position, drunkenness, violations of the rules of behavior for a Soviet seaman abroad, and amoral acts among the senior command. During the last three years 83 captains were released from duty for accidents and personal lack of discipline.

All of these problems are very well known to the leaders of the administrations, the GKHO, the steamship companies, and the ports. However, practically no effective measures are taken to stop these workers. The work of dockers is poorly organized and little is done to create the necessary housing and cultural and domestic conditions for them.

The administration of cadres, the GKHO, and the steamship companies have to expend a maximum effort to eliminate the serious shortcomings in the work with cadres and to unswervingly accomplish the tasks facing maritime transport in 1980 in the light of the decree of the CC CPSU and the speech of Comrade L. I. Brezhnev at the November (1979) Plenum of the CC CPSU. "It is necessary to act more decisively here," Comrade L. I. Brezhnev said at the Plenum, "to employ other measures, to replace those who are not coping with their work, and to be more bold in promoting energetic and creatively thinking comrades who show initiative."

Concern for health and for safe work at production is one of our most important tasks at the present time. Today constant attention is being given to the problems of labor protection and measures are being taken to create normal sanitary and hygienic conditions in the fleet and at coastal enterprises and to eliminate the causes of accidents.

It is sufficient to say that in three and one-half years of the Tenth Five-Year Plan 141.4 million rubles were spent to carry out measures to improve labor protection and safety.

The work being done to protect labor and improve safety has brought about a decrease in injuries. In three years of the five-year plan their frequency indicator has decreased by 26 percent in the ministry of the maritime fleet as a whole.

However, not everywhere are these questions being given the necessary attention. In nine months of 1979 injuries increased in the Novorossiysk, Murmansk, Caspian, Central Asian, and Estonian Steamship Companies and in the Northeastern Administration for the maritime fleet.

The cargo shipments plan in coastal shipping for 1980 has been established with a 1 percent increase compared to the report for 1979. On the whole, this increase is small, but the shipments are increasing chiefly on labor intensive lines. Cargo shipments in foreign shipping are planned to increase by 3.9 million tons.

The GKHO and the steamship companies have to give serious thought, with regard to the actions of the United States and its allies to the most rational disposition of the fleet by shipment lines and directions in order to overcome the discriminatory measures and fully supply tonnage for the needs of foreign trade for export and import shipments and punctually charter surplus tonnage for cargo shipments for foreign charterers, making use of this case of the capacities of ships in ancillary and ballast directions.

In 1980 it is planned to ship and transship substantial amounts of import cargoes through the ports, and also to ship equipment from the ports for the Socialist Republic of Vietnam, Cuba, and African countries.

The coordinated work of transportation centers is becoming especially important for ensuring the fulfillment of these assignments. The chiefs of the GKHO steamship companies and the UEF and P have to give the most serious attention to organizing the work of the fleet and the ports within the transportation centers and ensure their most efficient use.

The amount of industrial production by ship repairing plants in normed processing costs is planned to increase by 5.5 percent. In 1980 along with an increase in the amount of ship repairs by 4.8 percent, it is planned to increase ship construction by 14.9 percent.

Labor productivity in 1980 compared to 1979 is supposed to increase by 4.1 percent. In the plan for 1980 the ministry has been allocated capital investments amounting to 1, 126,900,000 rubles, including 181 million rubles for construction and installation work. Of the total capital investments, 81 percent is being assigned for the reequipping and reconstruction of operating enterprises.

Fixed capital with a value of 1,131,800,000 rubles is supposed to be built and commissioned on the basis of the allocated funds. This includes loading complexes in maritime ports with a wharf front length of 2,023 linear meters for processing 3.19 million tons a year; shops for ship repair plants with an area of 12,026 square meters, ship repair wharves with a length of 255 linear meters, and storage units for potatoes, vegetables, and fruits with a capacity of 3,500 tons; general warehouses with an area of 27,470 square meters; dining rooms for 830 people, educational institutions with an area of 9,800 square meters, vocational and technical schools for 1200 people, and a number of other facilities.

In the development of the capital construction plan provision has been made for the concentration of resources on the most important start-up and carryover construction projects and objects, and the number of newly begun production purpose construction projects which have an estimated value of 3 million rubles has been sharply limited.

The construction of residential houses and other social and domestic facilities has been allocated 81.9 million rubles of capital investments, including 71,450,000 rubles for construction and installation work. With these funds it is planned to commission residential houses with a total area of 343,000 square meters and children's pre-school institutions for 1,310 children, and to continue the construction of health institutions in Tuapsa, Slavyansk, and Arkhangel'sk.

The total profitability of fixed and circulating capital is planned to increase by .7 points and will come to 16.94 percent. In keeping with the increase in fixed capital, depreciation allowances are planned for 1980 in the amount of 993.2 million rubles.

The income part of the financial plan envisages an economy of 25.1 million rubles in capital investments from a decrease in equipment prices and the mobilization of internal resources in capital construction in the amount of 13.1 million rubles.

The allotments to the economic stimulation funds for 1980 have been set in accordance with the growth rates of the fund-forming indicators in the amount of 201.1 million rubles compared to 183.6 million rubles in the 1979 plan.

The results of our work are evaluated in terms of the fulfillment of planning assignments and the level of effectiveness of the use of fixed capital and circulating capital. The level of the development of production in the branch demands a substantial improvement of economic management, an increase in planning and financial discipline, and an improvement of economic work. Without this it is impossible to make effective use of the enormous fixed capital which is under the management of our enterprises.

The planning assignments which have been approved by the ministry for 1980 are strenuous but realistic. The steamship companies and the GKHO possess the amount of material and labor resources necessary to fulfill these assignments. With the existence of a sufficiently developed material and technical base and of labor resources the fulfillment of planning assignments depends upon the level of organization and management. The fulfillment of the plans will be the work of people and cadres and of the degree of organization and the level of management.

In order to ensure the fulfillment of plans and socialist commitments the ministry with the participation of the GKHO and the steamship companies has developed organizational and technical and mass political measures which provide for a complex of measures that make it possible to raise the level of operations work and the effectiveness of the use of fixed capital, to improve the use of specialized ships, improve the structure of the organization and economics of the work of the lines, and make fuller use of existing reserves, including on the basis of more organized work in accordance with scientifically substantiated norms and advanced experience and the introduction of developed automated management systems programs.

Concrete assignments have been established to increase the gross intensity of the processing of the fleet in the ports and to reduce idle time on

the basis of a fuller use of piers and of the labor power of the fishing, timber, and river ports of the Ukraine and the RSFSR.

The collectives of state cost accounting associations, steamship companies, ports, ship repair plants, and other enterprises of maritime transport have to take as a basis the organizational and technical and mass political measures which have been developed by the Ministry of the Maritime Fleet, guiding themselves by the decisions of the November (1979) Plenum of the CC CPSU and the statements of the General Secretary of the CC CPSU and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev on the questions of the economic and social development of the country to concretize them with the data of their own analysis of local capabilities, and to develop a socialist competition for the successful fulfillment of the plans and commitments of 1980 and of the Tenth Five-Year Plan.

2959

CSO: 1829

BRIEFS

NEW SHIP SERIES--The shipbuilders of Nikolayev are creating a new series of the largest Soviet rolers. Each one has a displacement of 35,000 tons, a gas turbine capacity of 50,000 horsepower, is more than 227 meters long and 30 meters wide, has a cruising distance of 20,000 miles, and a speed of 27 knots. The first ship of this flotilla -- the "Captain Smirnov" -- has been working for a long time in the Baltic Steamship Company. The labor biography of the second ship of this type has only just begun here. The "Captain Mezentsev" has arrived in Leningrad from the Black Sea. It is named in honor of the well-known captain who played an important role in the development of our maritime fleet. The gas turbine vessel has delivered a large consignment of containers which it picked up in Il'ichevsk for the Baltic people. Its first working run has been successfully completed in the waters of six seas, in a number of gulfs, and in the Atlantic. The ship has demonstrated good seagoing and maneuvering qualities. In front of the crew there is an ocean voyage. [Text] Moscow VODNYI TRANSPORT in Russian 5 Feb 80 p 4] 2959

NEW AUTOMATED MANAGEMENT SYSTEM--The second stage of an automated management system has gone into production operations in the Northern Maritime Steamship Company. "It would be difficult to overestimate the importance of this event for us," says the chief of the information and computer center of the Northern Maritime Steamship Company Ye. Murav'yev. "The commissioning of the second stage will make it possible to greatly improve quality and efficiency in making decisions connected with managing the work of the fleet and the ports of the steamship company." A large number of tasks which in the past were accomplished by hand with great difficulty have been put into the second stage of the automated management system. Now economists and operations workers will be able to flexibly and accurately establish the reasons for unplanned losses and prevent them. In all, six subsystems which include within themselves 25 tasks have been introduced into the second stage of the automated management system of the Northern Maritime Steamship Company. [Text] [Moscow VODNYI TRANSPORT in Russian 12 Feb 80 p 2] 2959

FISHING RESULTS--The floating canning plant "Nataliya Kovshova" on which a komsomol youth crew is working has returned to its port of registry after almost two years of sailing in the Pacific Ocean. A year ago the ship was supposed to undergo plant repairs at a foreign wharf. The seamen performed the repair themselves and prolonged the operational period of the mechanisms. On its last cruise despite unfavorable fishing conditions the collective fulfilled its assignment ahead of schedule. Twenty-three percent of the fish output was prepared in excess of the plan. Two million cans of fish which were produced with the Token of Quality have been sent to Moscow and Kiev for the participants and guests of the 1980 Olympics. [Text] [Moscow VODNYI TRANSPORT in Russian 12 Feb 80 p 4] 2959

FISHING EQUIPMENT PROBLEMS--During the fishing season we receive various kinds of equipment in containers. For example, 30 units once came to our trawler. We managed with great difficulty to send the "empty" freight back on the shore. As a rule, the fish reception bases which take care of deliveries do not accept it. And this is understandable -- it is not useful to transport air for thousands of miles. Remaining on the trawler for a long time, the containers block up the deck and hinder the normal work of the fishermen. I believe that they could be made to disassemble. In that form they would occupy less space and would be more convenient to transport. [Text] Moscow VODNYI TRANSPORT in Russian 26 Feb 80 p 3] 2959

ASSISTANCE TO KAMPUCHEA--The motorship "Lyubov Orlova" of the Far Eastern Steamship Line was today awarded the Order of Friendship of Peoples. More than 5 months ago nearly 100 Far Eastern dock workers and the crew of the motorship "Lyubov Orlova" worked for 78 days in the Kampuchean port of Kompong Son, rendering disinterested aid to the liberated people. During their stay in Kampuchea they processed more than 30 vessels and over 64,000 tons of cargo. The award was presented today by kraykom first secretary Lomaking a few hours before the motorship sailed again for the Kampuchean port. [OW111717 Vladivostok Domestic Service in Russian 0930 GMT 10 Apr 80 OW]

PEVEK PORT CRANES--A special commission chaired by the chief engineer of the Pevek arctic port has accepted for use a new gantry crane in Pevek port. The Dalmormontazh Trust's brigade from Nakhodka which assembled the crane has now begun installation of another powerful gantry crane. The new crane will handle heavy cargoes and will be commissioned before the navigation season opens. [Magadan Domestic Service in Russian 0755 GMT 24 Mar 80 OW]

END

CSO: 1829

## SELECTIVE LIST OF JPRS SERIAL REPORTS

### USSR SERIAL REPORTS (GENERAL)

USSR REPORT: Agriculture  
USSR REPORT: Economic Affairs  
USSR REPORT: Construction and Equipment  
USSR REPORT: Military Affairs  
USSR REPORT: Political and Sociological Affairs  
USSR REPORT: Energy  
USSR REPORT: International Economic Relations  
USSR REPORT: Consumer Goods and Domestic Trade  
USSR REPORT: Human Resources  
USSR REPORT: Transportation  
USSR REPORT: Translations from KOMMUNIST\*  
USSR REPORT: PROBLEMS OF THE FAR EAST\*  
USSR REPORT: SOCIOLOGICAL STUDIES\*  
USSR REPORT: USA: ECONOMICS, POLITICS, IDEOLOGY\*

### USSR SERIAL REPORTS (SCIENTIFIC AND TECHNICAL)

USSR REPORT: Life Sciences: Biomedical and Behavioral Sciences  
USSR REPORT: Life Sciences: Effects of Nonionizing Electromagnetic Radiation  
USSR REPORT: Life Sciences: Agrotechnology and Food Resources  
USSR REPORT: Chemistry  
USSR REPORT: Cybernetics, Computers and Automation Technology  
USSR REPORT: Electronics and Electrical Engineering  
USSR REPORT: Engineering and Equipment  
USSR REPORT: Earth Sciences  
USSR REPORT: Space  
USSR REPORT: Materials Science and Metallurgy  
USSR REPORT: Physics and Mathematics  
USSR REPORT: SPACE BIOLOGY AND AEROSPACE MEDICINE\*

### WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality  
WORLDWIDE REPORT: Epidemiology  
WORLDWIDE REPORT: Law of the Sea  
WORLDWIDE REPORT: Nuclear Development and Proliferation  
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

\*Cover-to-cover

**END OF**

**FICHE**

**DATE FILMED**

9 MAY 80

~~RECEIVED~~

DD